Fig. 1

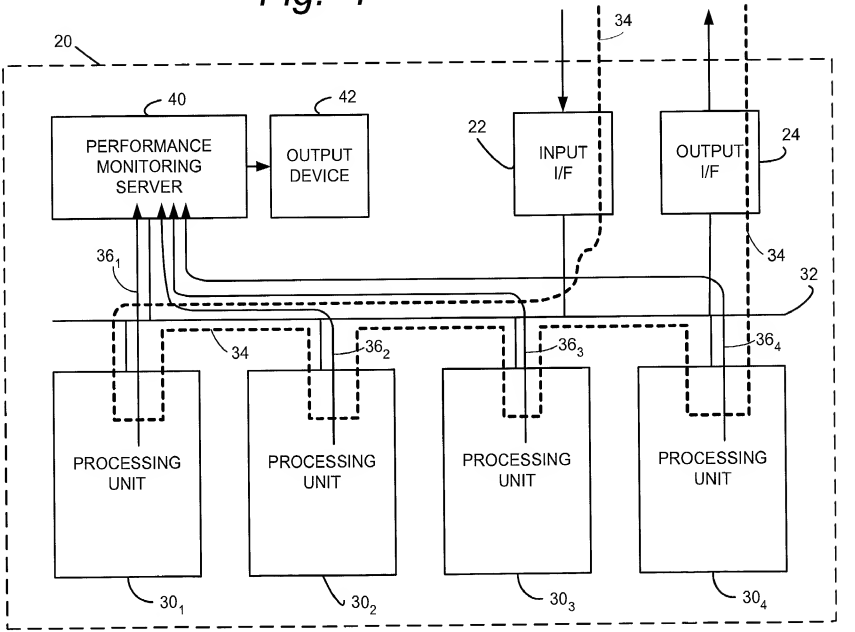

20
34
40
42
PERFORMANCE MONITORING SERVER
OUTPUT DEVICE
22
INPUT I/F
OUTPUT I/F
24
36_1
34
32
34
36_2
36_3
36_4
PROCESSING UNIT
PROCESSING UNIT
PROCESSING UNIT
PROCESSING UNIT
30_1
30_2
30_3
30_4

Fig. 2

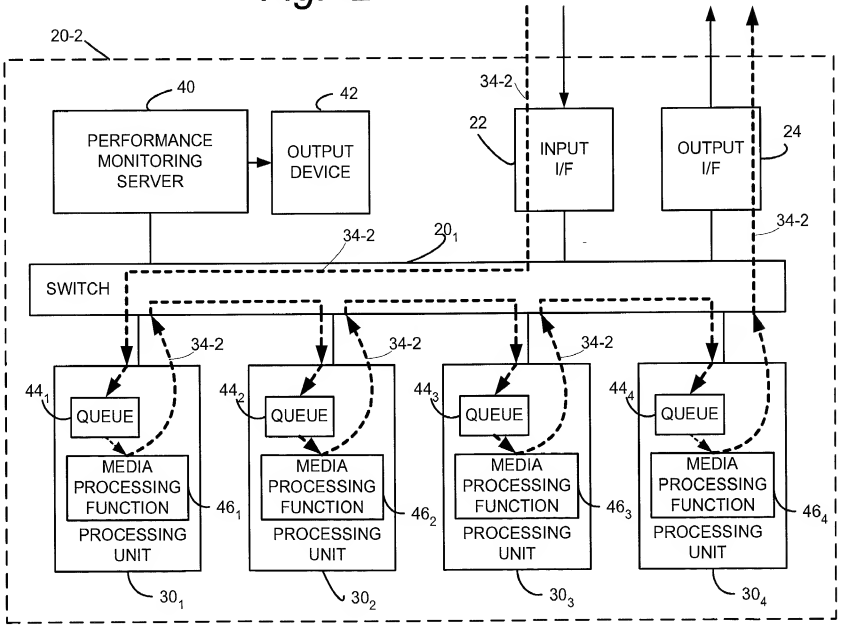

20-2
40
PERFORMANCE MONITORING SERVER
42
OUTPUT DEVICE
34-2
22
INPUT I/F
OUTPUT I/F
24
34-2
34-2
20_1
SWITCH
34-2
34-2
34-2
44_1
QUEUE
MEDIA PROCESSING FUNCTION
46_1
PROCESSING UNIT
30_1
44_2
QUEUE
MEDIA PROCESSING FUNCTION
46_2
PROCESSING UNIT
30_2
44_3
QUEUE
MEDIA PROCESSING FUNCTION
46_3
PROCESSING UNIT
30_3
44_4
QUEUE
MEDIA PROCESSING FUNCTION
46_4
PROCESSING UNIT
30_4

Fig. 3

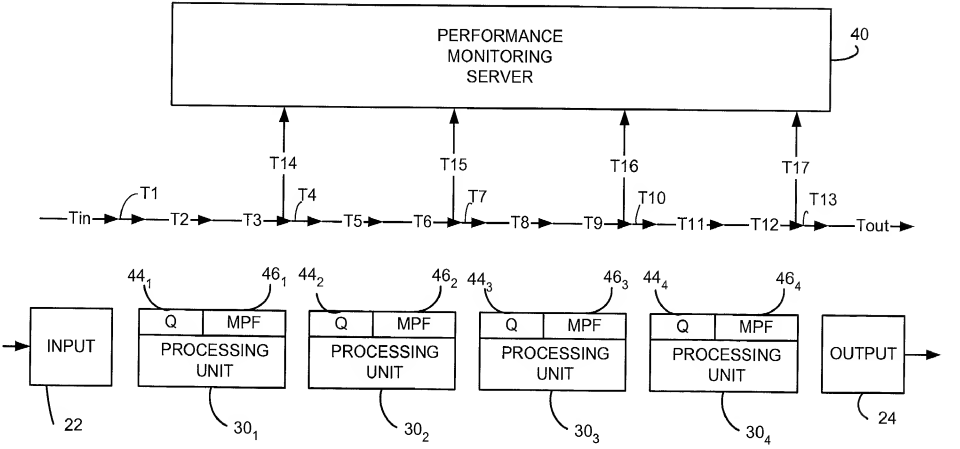
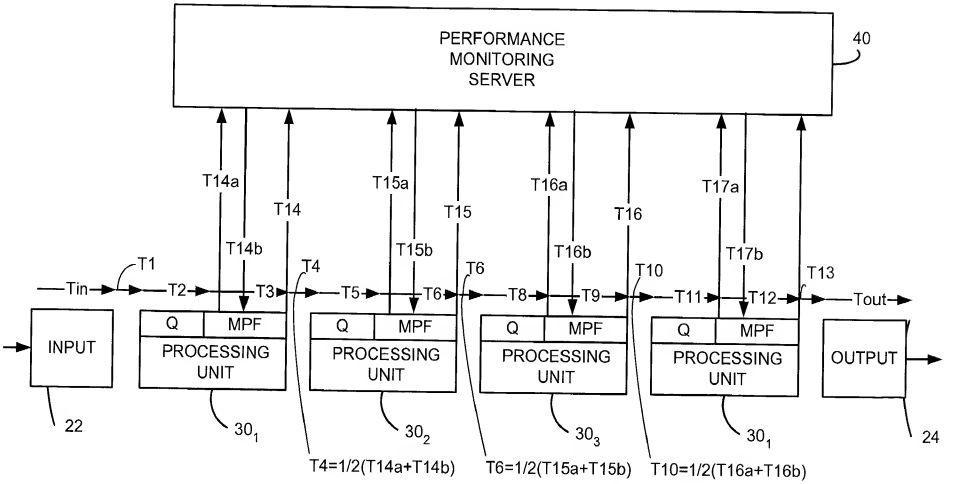

PERFORMANCE MONITORING SERVER
40
T14
T15
T16
T17
T1
T4
T7
T10
T13
Tin
T2
T3
T5
T6
T8
T9
T11
T12
Tout
44_1
46_1
44_2
46_2
44_3
46_3
44_4
46_4
Q
MPF
PROCESSING UNIT
INPUT
OUTPUT
22
24
30_1
30_2
30_3
30_4

Fig. 4


PERFORMANCE MONITORING SERVER
40
T14a
T14b
T14
T15a
T15b
T15
T16a
T16b
T16
T17a
T17b
T1
T4
T6
T10
T13
Tin
T2
T3
T5
T6
T8
T9
T11
T12
Tout
INPUT
Q
MPF
PROCESSING UNIT
OUTPUT
22
30$_1$
30$_2$
30$_3$
30$_1$
24
T4=1/2(T14a+T14b)
T6=1/2(T15a+T15b)
T10=1/2(T16a+T16b)

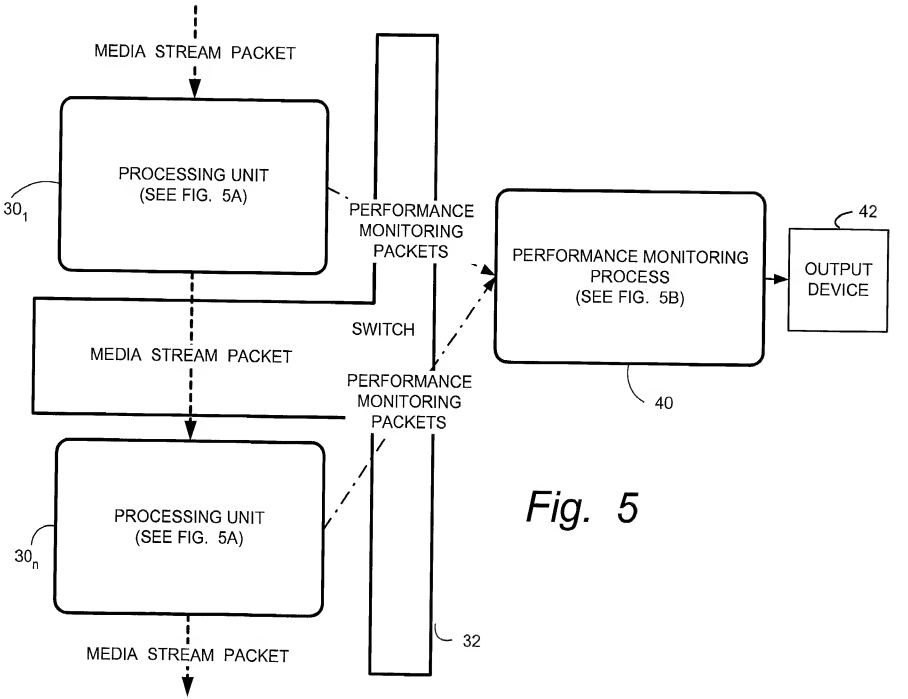

MEDIA STREAM PACKET
PROCESSING UNIT
(SEE FIG. 5A)
30 1
PERFORMANCE
MONITORING
PACKETS
PERFORMANCE MONITORING
PROCESS
(SEE FIG. 5B)
42
OUTPUT
DEVICE
SWITCH
MEDIA STREAM PACKET
PERFORMANCE
MONITORING
PACKETS
40
PROCESSING UNIT
(SEE FIG. 5A)
30 n
32
MEDIA STREAM PACKET

Fig. 5

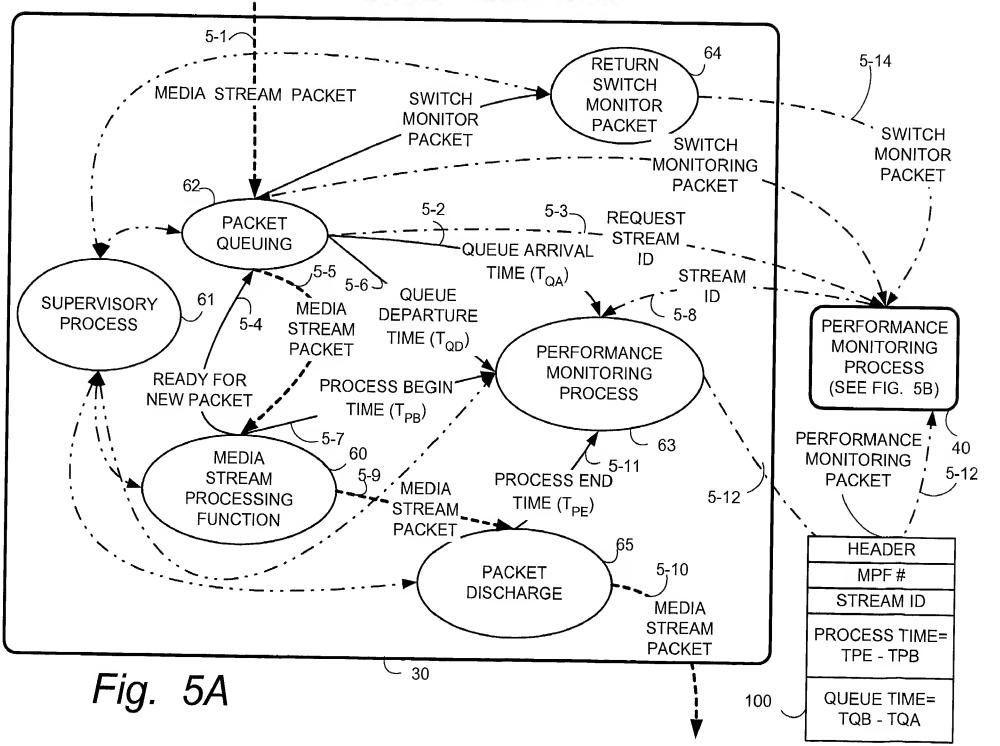

5-1
MEDIA STREAM PACKET
SWITCH MONITOR PACKET
RETURN SWITCH MONITOR PACKET
64
5-14
SWITCH MONITOR PACKET
SWITCH MONITORING PACKET
62
PACKET QUEUING
5-2
5-3
REQUEST STREAM ID
QUEUE ARRIVAL TIME (T_{QA})
STREAM ID
5-8
SUPERVISORY PROCESS
61
5-4
5-5
MEDIA STREAM PACKET
5-6
QUEUE DEPARTURE TIME (T_{QD})
PERFORMANCE MONITORING PROCESS (SEE FIG. 5B)
READY FOR NEW PACKET
PROCESS BEGIN TIME (T_{PB})
PERFORMANCE MONITORING PROCESS
63
5-7
MEDIA STREAM PROCESSING FUNCTION
60
5-9
5-11
PROCESS END TIME (T_{PE})
PERFORMANCE MONITORING PACKET
40
5-12
5-12
MEDIA STREAM PACKET
HEADER
MPF #
STREAM ID
PROCESS TIME= TPE - TPB
QUEUE TIME= TQB - TQA
100
65
PACKET DISCHARGE
5-10
MEDIA STREAM PACKET
30

Fig. 5A

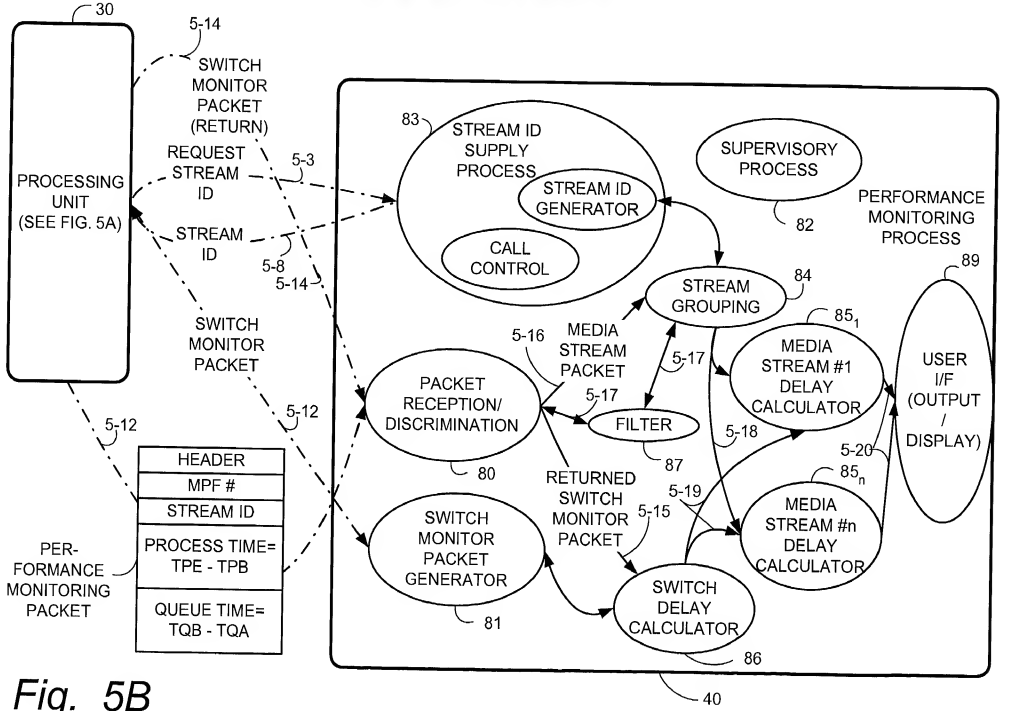

30
PROCESSING UNIT (SEE FIG. 5A)
5-14
SWITCH MONITOR PACKET (RETURN)
REQUEST STREAM ID
5-3
STREAM ID
5-8
5-14
SWITCH MONITOR PACKET
5-12
5-12
HEADER
MPF #
STREAM ID
PROCESS TIME= TPE - TPB
QUEUE TIME= TQB - TQA
PER-FORMANCE MONITORING PACKET
83
STREAM ID SUPPLY PROCESS
STREAM ID GENERATOR
CALL CONTROL
SUPERVISORY PROCESS
82
PERFORMANCE MONITORING PROCESS
89
84
STREAM GROUPING
85 1
MEDIA STREAM #1 DELAY CALCULATOR
5-16
MEDIA STREAM PACKET
5-17
5-17
PACKET RECEPTION/ DISCRIMINATION
80
FILTER
87
5-18
5-20
USER I/F (OUTPUT / DISPLAY)
RETURNED SWITCH MONITOR PACKET
5-15
5-19
85 n
MEDIA STREAM #n DELAY CALCULATOR
SWITCH MONITOR PACKET GENERATOR
81
SWITCH DELAY CALCULATOR
86
40

Fig. 5B

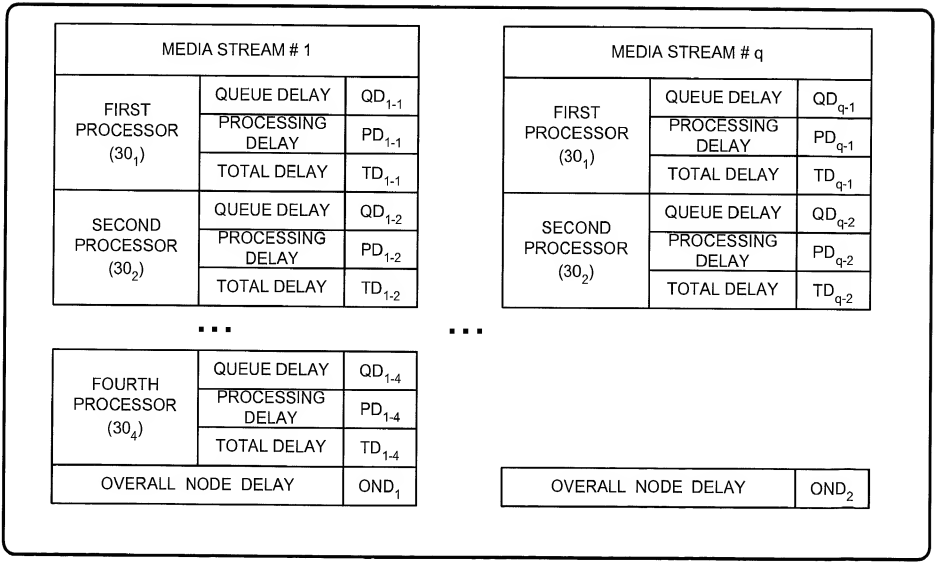
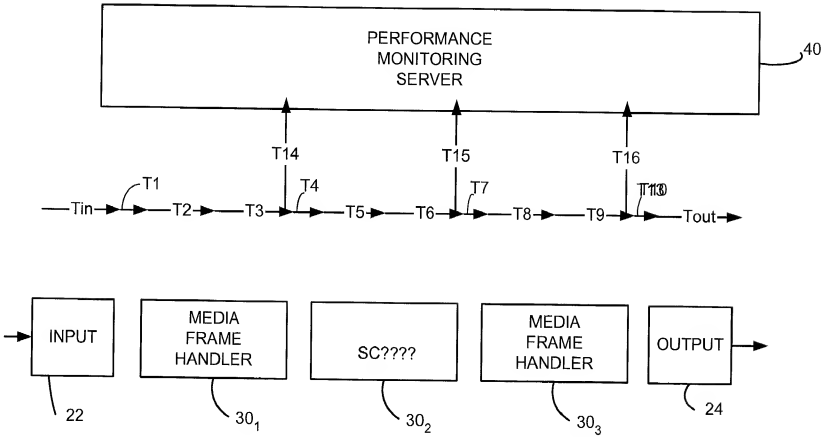

MEDIA STREAM # 1
FIRST PROCESSOR (30_1)
QUEUE DELAY
QD_{1-1}
PROCESSING DELAY
PD_{1-1}
TOTAL DELAY
TD_{1-1}
SECOND PROCESSOR (30_2)
QUEUE DELAY
QD_{1-2}
PROCESSING DELAY
PD_{1-2}
TOTAL DELAY
TD_{1-2}
FOURTH PROCESSOR (30_4)
QUEUE DELAY
QD_{1-4}
PROCESSING DELAY
PD_{1-4}
TOTAL DELAY
TD_{1-4}
OVERALL NODE DELAY
OND_1
MEDIA STREAM # q
FIRST PROCESSOR (30_1)
QUEUE DELAY
QD_{q-1}
PROCESSING DELAY
PD_{q-1}
TOTAL DELAY
TD_{q-1}
SECOND PROCESSOR (30_2)
QUEUE DELAY
QD_{q-2}
PROCESSING DELAY
PD_{q-2}
TOTAL DELAY
TD_{q-2}
OVERALL NODE DELAY
OND_2

Fig. 6

Fig. 7


PERFORMANCE MONITORING SERVER
40
T14
T15
T16
T1
T4
T7
T10
Tin
T2
T3
T5
T6
T8
T9
Tout
INPUT
22
MEDIA FRAME HANDLER
30 1
SC????
30 2
MEDIA FRAME HANDLER
30 3
OUTPUT
24